SYSTEMS AND METHODS FOR MODELING THE IMPACT OF A MEDIUM ON THE APPEARANCES OF ENCOMPASSED LIGHT SOURCES

Abstract

5

The present invention provides systems and methods for modeling the impact of a

medium on the appearances of encompassed light sources using a Legendre polynomial series
solution to a Radiative Transfer Equation for Spherical Media (RTE-SM) called an
Atmospheric Point Spread Function (APSF). Using this APSF, it is possible to determine
characteristics of the medium causing the multiple scattering of the light from the
encompassed light source. For example, by observing a street light in bad weather at night,
using the APSF, it is possible to determine whether the bad weather is haze, mist, fog, or rain.
Similarly, the APSF may be used to estimate the size of particles in a liquid. It is also
possible using the APSF to remove and/or add an effect of the medium on a light source
captured in an image.